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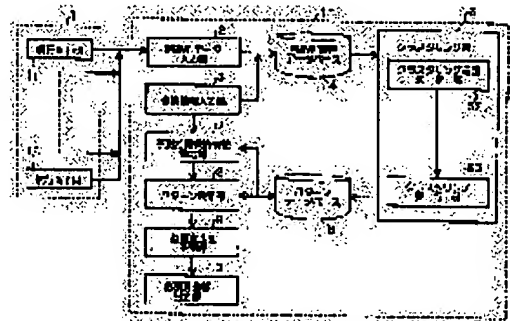
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(54) FUND AMOUNT ESTIMATING METHOD AND FUND AMOUNT ESTIMATING DEVICE OF AUTOMATIC TELLER MACHINE

(57)Abstract:

PROBLEM TO BE SOLVED: To provide a fund amount estimating device of an automatic teller machine capable of remarkably improving estimating precision of required fund amount.

SOLUTION: Pieces of transaction information of the automatic teller machines 11 to 1n, environmental information when transaction occurs are stored in a time series information database 4. Crustering is performed for time series data stored in the time series information database 4 by defining preliminarily provided one month as a range of the clustering and the crusted time series data is stored as time series pattern data in a pattern database 6 by a clustering part 5. The environmental information of an estimation period is specified by an estimation period environmental information specification part 7, a proper reference time series pattern is retrieved from the pattern database 6 based on the environmental information of the specified estimation period by a pattern retrieval part 8 and the required fund amount in the estimation period is estimated based on the retrieved reference time series data by a required fund amount estimating part 9.



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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] From the time series data of the dealings information on the past of Consumer Transaction Facility in financial institutions, such as a cash dispenser, a cash automate Teller's machine, etc. of a bank, and the environmental information at the time of dealings generating, this invention generates typical dealings pattern data using a clustering means, and relates to the amount prediction approach of funds of Consumer Transaction Facility and the amount prediction equipment of funds which predict the amount of need funds of a prediction period using the pattern data.

[0002]

[Description of the Prior Art] For example, they want for there to be many amounts of the cash which remains without storing a lot of cash in Consumer Transaction Facility (a cash dispenser, cash automated Teller's machine, etc.) in financial institutions, such as a bank, among those being used, and not to raise a fund piece, but to reduce the amount of the cash stored in Consumer Transaction Facility, and to raise leverage.

[0003] Then, a required fund is predicted recently and the equipment it is directed that stores a suitable quantity of cash in Consumer Transaction Facility is proposed.

[0004] The prediction approach which predicts the amount of need funds is learned by storing a user's dealings information in Consumer Transaction Facility, carrying out the grouping of Consumer Transaction Facility of a store according to a use inclination from the dealings information, generating and saving each group's representation dealings pattern, and referring to the data of the pattern with which the Consumer Transaction Facility concerned belongs as indicated by JP,8-137974,A as the example.

[0005] Grouping totaled dealings information day by day [1], calculated the amount of dealings on the 1st, gathered the dealings data on the 1st which totaled by one month, and made it time series data, and the approach of clustering the time series data was taken. Since it is clustering collectively by one month, the dealings inclination of Consumer Transaction Facility for one month can be made to reflect in a representation dealings pattern.

[0006] However, since the dealings inclinations reflected in a representation dealings pattern by what period it clusters differ, how the range which clusters is taken is the important problem which influences the precision of prediction of the amount of need funds.

[0007]

[Problem(s) to be Solved by the Invention] Thus, if it was in the former, since the range which clusters was taken with one month, only the dealings trend for one month has been reflected in the representation dealings pattern. Therefore, predictability in case dealings inclinations differ greatly was getting worse in a special date which a dealings inclination will differ from for one day, and several months when dealings inclinations differ continuously for one week.

[0008] Moreover, since the range which clusters was made into the fixed value, predictability was not able to respond, when the direction which changed the range of clustering according to the situation became high.

[0009] Then, this invention aims at offering the amount prediction approach of funds of Consumer Transaction Facility and the amount prediction equipment of funds which can improve the predictability of the amount of need funds remarkably.

[0010]

[Means for Solving the Problem] While the amount prediction approach of funds of Consumer Transaction Facility of this invention inputs the time series data of the dealings information from Consumer Transaction Facility Environmental information, such as a date at the time of dealings generating of said Consumer Transaction Facility and a day of the week, is inputted. Make the time series data and environmental information which were these-inputted correspond, and it memorizes for the 1st storage means. A time series pattern is acquired by clustering the range of

clustering for the time series data memorized for this 1st storage means as one day. This acquired time series pattern is memorized for the 2nd storage means with said inputted environmental information. Specify the environmental information of a prediction period and the environmental information of this specified prediction period is used. The time series pattern and environmental information of the past corresponding to a prediction period are searched from said 2nd storage means, and it is characterized by predicting the amount of need funds of a prediction period using this time series pattern and environmental information that were searched.

[0011] Moreover, the amount prediction approach of funds of Consumer Transaction Facility of this invention While inputting the time series data of the dealings information from Consumer Transaction Facility, the date at the time of dealings generating of said Consumer Transaction Facility, Input environmental information, such as a day of the week, and make the time series data and environmental information which were these-inputted correspond, and it memorizes for the 1st storage means. A time series pattern is acquired by clustering the time series data memorized for this 1st storage means as date order three days which gave the range of clustering beforehand. This acquired time series pattern is memorized for the 2nd storage means with said inputted environmental information. Specify the environmental information of a prediction period and the environmental information of this specified prediction period is used. The time series pattern and environmental information of the past corresponding to a prediction period are searched from said 2nd storage means, and it is characterized by predicting the amount of need funds of a prediction period using this time series pattern and environmental information that were searched.

[0012] Moreover, the amount prediction approach of funds of Consumer Transaction Facility of this invention While inputting the time series data of the dealings information from Consumer Transaction Facility, the date at the time of dealings generating of said Consumer Transaction Facility, Input environmental information, such as a day of the week, and make the time series data and environmental information which were these-inputted correspond, and it memorizes for the 1st storage means. A time series pattern is acquired by clustering the time series data memorized for this 1st storage means as a period of the arbitration which gave the range of clustering beforehand. This acquired time series pattern is memorized for the 2nd storage means with said inputted environmental information. Specify the environmental information of a prediction period and the environmental information of this specified prediction period is used. The time series pattern and environmental information of the past corresponding to a prediction period are searched from said 2nd storage means, and it is characterized by predicting the amount of need funds of a prediction period using this time series pattern and environmental information that were searched.

[0013] Moreover, the amount prediction approach of funds of Consumer Transaction Facility of this invention While inputting the time series data of the dealings information from Consumer Transaction Facility, the date at the time of dealings generating of said Consumer Transaction Facility, Input environmental information, such as a day of the week, and make the time series data and environmental information which were these-inputted correspond, and it memorizes for the 1st storage means. A user inputs the information for determining the range of clustering, and the range of clustering is determined based on this inputted information. In the range of this determined clustering A time series pattern is acquired by clustering the time series data memorized by said 1st storage means. This acquired time series pattern is memorized for the 2nd storage means with said inputted environmental information. Specify the environmental information of a prediction period and the environmental information of this specified prediction period is used. The time series pattern and environmental information of the past corresponding to a prediction period are searched from said 2nd storage means, and it is characterized by predicting the amount of need funds of a prediction period using this time series pattern and environmental information that were searched.

[0014] Moreover, the amount prediction approach of funds of Consumer Transaction Facility of this invention While inputting the time series data of the dealings information from Consumer Transaction Facility, the date at the time of dealings generating of said Consumer Transaction Facility, Input environmental information, such as a day of the week, and make the time series data

and environmental information which were these-inputted correspond, and it memorizes for the 1st storage means. The information for determining the range of clustering is collected automatically and is inputted, and the range of clustering is determined based on this inputted information. In the range of this determined clustering a time series pattern is acquired by clustering the time series data memorized by said 1st storage means. This acquired time series pattern is memorized for the 2nd storage means with said inputted environmental information. Specify the environmental information of a prediction period and the environmental information of this specified prediction period is used. The time series pattern and environmental information of the past corresponding to a prediction period are searched from said 2nd storage means, and it is characterized by predicting the amount of need funds of a prediction period using this time series pattern and environmental information that were searched.

[0015] Moreover, the amount prediction equipment of funds of Consumer Transaction Facility of this invention 1st input means to input the time series data of the dealings information from Consumer Transaction Facility, 2nd input means to input environmental information, such as a date at the time of dealings generating of said Consumer Transaction Facility, and a day of the week, The 1st storage means which the environmental information inputted with the time series data inputted with said 1st input means and said 2nd input means is made to correspond, and memorize it, A clustering means to obtain a time series pattern by clustering the range of clustering for the time series data memorized by this 1st storage means as one day, The 2nd storage means memorized with the environmental information into which the time series pattern obtained with the clustering means was inputted with said 2nd input means, A retrieval means to search the time series pattern and environmental information of the past corresponding to a prediction period from said 2nd storage means using the environmental information of the prediction period specified with an assignment means to specify the environmental information of a prediction period, and this assignment means, A prediction means to predict the amount of need funds of a prediction period using the time series pattern and environmental information which were searched with this retrieval means is provided.

[0016] Moreover, the amount prediction equipment of funds of Consumer Transaction Facility of this invention 1st input means to input the time series data of the dealings information from Consumer Transaction Facility, 2nd input means to input environmental information, such as a date at the time of dealings generating of said Consumer Transaction Facility, and a day of the week, The 1st storage means which the environmental information inputted with the time series data inputted with said 1st input means and said 2nd input means is made to correspond, and memorize it, A clustering means to obtain a time series pattern by clustering the time series data memorized by this 1st storage means as date order three days which gave the range of clustering beforehand. The 2nd storage means memorized with the environmental information into which the time series pattern obtained with this clustering means was inputted with said 2nd input means, A retrieval means to search the time series pattern and environmental information of the past corresponding to a prediction period from said 2nd storage means using the environmental information of the prediction period specified with an assignment means to specify the environmental information of prediction period, and this assignment means, A prediction means to predict the amount of need funds of a prediction period using the time series pattern and environmental information which were searched with this retrieval means is provided.

[0017] Moreover, the amount prediction equipment of funds of Consumer Transaction Facility of this invention 1st input means to input the time series data of the dealings information from Consumer Transaction Facility, 2nd input means to input environmental information, such as a date at the time of dealings generating of said Consumer Transaction Facility, and a day of the week, The 1st storage means which the environmental information inputted with the time series data inputted with said 1st input means and said 2nd input means is made to correspond, and memorize it, A clustering means to obtain a time series pattern by clustering the time series data memorized by this 1st storage means as a period of the arbitration which gave the range of clustering beforehand, The 2nd storage means memorized with the environmental information into which the

time series pattern obtained with this clustering means was inputted with said 2nd input means, A retrieval means to search the time series pattern and environmental information of the past corresponding to a prediction period from said 2nd storage means using the environmental information of the prediction period specified with an assignment means to specify the environmental information of a prediction period, and this assignment means, A prediction means predict the amount of need funds of a prediction period using the time series pattern and environmental information which were searched with this retrieval means is provided.

[0018] Moreover, the amount prediction equipment of funds of Consumer Transaction Facility of this invention 1st input means to input the time series data of the dealings information from Consumer Transaction Facility, 2nd input means to input environmental information, such as a date at the time of dealings generating of said Consumer Transaction Facility, and a day of the week, The 1st storage means which the environmental information inputted with the time series data inputted with said 1st input means and said 2nd input means is made to correspond, and memorize it, 3rd input means by which a user inputs the information for determining the range of clustering. In the range of the clustering determined with a decision means to determine the range of clustering based on the information inputted with this 3rd input means, and this decision means A clustering means to obtain a time series pattern by clustering the time series data memorized by said 1st storage means, The 2nd storage means memorized with the environmental information in which the time series pattern obtained with this clustering means was inputted with said 2nd input means, A retrieval means to search the time series pattern and environmental information of the past corresponding to a prediction period from said 2nd storage means using the environmental information of the prediction period specified with an assignment means to specify the environmental information of a prediction period, and this assignment means, A prediction means predict the amount of need funds of a prediction period using the time series pattern and environmental information which were searched with this retrieval means is provided.

[0019] Furthermore, the amount prediction equipment of funds of Consumer Transaction Facility this invention 1st input means to input the time series data of the dealings information from Consumer Transaction Facility, 2nd input means to input environmental information, such as a date at the time of dealings generating of said Consumer Transaction Facility, and a day of the week, The 1st storage means which the environmental information inputted with the time series data inputted with said 1st input means and said 2nd input means is made to correspond, and memorize it, 3rd input means to collect the information for determining the range of clustering automatically and to input it, In the range of the clustering determined with a decision means to determine the range of clustering based on the information inputted with this 3rd input means, and this decision means A clustering means to obtain a time series pattern by clustering the time series data memorized by said 1st storage means, The 2nd storage means memorized with the environmental information into which the time series pattern obtained with this clustering means was inputted with said 2nd input means, A retrieval means to search the time series pattern and environmental information of the past corresponding to a prediction period from said 2nd storage means using the environmental information of the prediction period specified with an assignment means to specify the environmental information of a prediction period, and this assignment means, A prediction means to predict the amount of need funds of a prediction period using the time series pattern and environmental information which were searched with this retrieval means is provided.

[0020] Since the dealings inclination of the period of the arbitration which could take the range of clustering for one week on the 1st at the period (one month or more) of the set-up arbitration, an example can be made to reflect according to this invention, the predictability of the amount of need funds can be improved remarkably.

[0021] Moreover, since a bank official in charge can input the information for determining the range of clustering into arbitration, the predictability of the amount of need funds can be improved to a representation dealings pattern reflecting the dealings inclination of the Consumer Transaction Facility concerned.

[0022] Moreover, since the information for determining the range of clustering can be automatically set up from information, such as dealings information and operation gestalt information on Consumer Transaction Facility, the time and effort of an information input of an official in charge is reducible.

[0023]

[Embodiment of the Invention] Hereafter, the gestalt of operation of this invention is explained with reference to a drawing.

[0024] In addition, the gestalt of this operation explains as an example the case where it applies the amount prediction equipment of funds of Consumer Transaction Facility, such as a cash dispenser of a bank, and a cash automated Teller's machine.

[0025] First, the gestalt of the 1st operation is explained.

[0026] Drawing 1 shows roughly the configuration of the amount prediction equipment of funds of Consumer Transaction Facility concerning the gestalt of the 1st operation. In drawing 1, it is the amount prediction equipment of funds with which 1 predicts the Consumer Transaction Facility group and 11 predicts the amount of need funds of the Consumer Transaction Facility group 1. the Consumer Transaction Facility group 1 -- 11-1n (bank ATM) of Consumer Transaction Facility, such as two or more cash dispensers and a cash automated Teller's machine, from -- it is constituted.

[0027] The amount prediction equipment 11 of funds 11-1n of two or more Consumer Transaction Facility from -- as 1st input means to input the time series data of each dealings information As 2nd input means to input the ***** data input section 2 and environmental information As 1st account means which memorizes the ***** input section 3 and time series data As a clusteri means to cluster the ***** information database 4 and time series data As the ** clustering section 5 and 2nd account means which memorizes the result of clustering It consists of the ** pattern database 6, the prediction period environmental-information specification part 7 as an assignment means to specify the environmental information of a prediction period, the pattern searching section 8 as a retrieval means, the amount prediction section 9 of need funds as a prediction means, and the amount output section 10 of need funds as an output means.

[0028] In such a configuration, rough work of the flow of the whole processing and each part is explained first. 11-1n of two or more Consumer Transaction Facility from -- dealings information such as payment and payment, is serially inputted from the time series data input section 2. On the other hand, environmental information, such as a date at the time of dealings generating, a day of the week, and the weather, is inputted from the environmental-information input section 3. Both the time series data and environmental information that were these-inputted are made to correspond, and are stored in the time series information database 4.

[0029] In addition, the environmental-information input section 3 is equipped with the sensors for investigating the calendar in which the date is shown, a clock, and the weather, and various environmental information was collected, it has the user interface, and an official in charge inputs environmental information by a keyboard etc.

[0030] The clustering section 5 considers as a cluster, is classified, carries out the grouping of that to which a time series pattern is similar to the time series data stored in the time series information database 4, and stores it in the pattern database 6 as time series pattern data.

[0031] In this way, where a time series pattern is stored in the pattern database 6, the prediction period environmental-information specification part 7 specifies environmental information, such as a period to predict and a date to the prediction period, a day of the week, and the weather, and sends the environmental information to the pattern searching section 8. The pattern searching section 8 searches a suitable reference time series pattern from the pattern database 6 based on the environmental information of the specified prediction period, and sends it to the amount prediction section 9 of need funds.

[0032] The amount prediction section 9 of need funds predicts the amount of need funds of a prediction period based on the searched reference time series data. The amount output section 1 of need funds outputs the information about the amount of need funds using a display, a printer,

etc. based on the amount of funds predicted in the amount prediction section 9 of need funds.

[0033] Next, the clustering section 5 is explained to a detail.

[0034] The clustering section 5 consists of the clustering range decision section 52 and the clustering activation section 53, as shown in drawing 1. The clustering range decision section 52 is sent to the clustering activation section 53 by making into the clustering range one month which is the fixed value given beforehand. The clustering activation section 53 clusters by fixing the clustering range with one month, as shown in drawing 2.

[0035] Here, the example of the approach of pattern data generation is explained using drawing 2. The time series data of the amount of dealings of four Consumer Transaction Facility ATM1, ATM2, ATM3, and ATM4 for one month from August 1, 1997 to August 31 are totaled per one day and transition is expressed with drawing 2, for example. The time series data of the part on the 31st from the 1st to the 31st are considered to be the points on 31 dimensions, and a cluster consists of things with a near distance using a suitable threshold.

[0036] Next, let the average value of the time series data of Consumer Transaction Facility which constituted the cluster be pattern data. As a result of clustering to the time series data of the amount of dealings of four Consumer Transaction Facility, ATM1, and ATM2, ATM3 and ATM4 constitute the cluster from drawing 2, respectively.

[0037] Next, the average of the amount of dealings of ATM1 and ATM2 is calculated, and a pattern 1 is generated. Moreover, similarly, the average of the amount of dealings of ATM3 and ATM4 is calculated, and a pattern 2 is generated.

[0038] As mentioned above, since pattern data are generable for every one month, the end of the month can reflect in pattern data the dealings inclination which made the period one month which a general economic trend many amounts of dealings to be.

[0039] Next, the gestalt of the 2nd operation is explained.

[0040] The equipment configuration of the gestalt of the 2nd operation explains only the processing of the clustering section 5 which omits illustration and explanation and is different from the gestalt of the 1st operation since it is the same as that of the gestalt of the 1st operation with which it was shown in drawing 1.

[0041] The clustering range decision section 52 is sent to the clustering activation section 53 by making into the clustering range the specific day which is the fixed value given beforehand, for example, payday order three days. The clustering activation section 53 clusters considering the clustering range as payday order three days.

[0042] Drawing 3 is the schematic diagram of the pattern day evening generation in the gestalt of the 2nd operation. The amount transition of dealings of four Consumer Transaction Facility ATM1, ATM2, ATM3, and ATM4 for one month from August 1, 1997 to August 31 is expressed with drawing 3, and the pattern 1 and the pattern 2 express pattern data in case a payday is on August 25 by it, for example. Since a payday is on August 25, the dealings information from August 22 to August 28 is clustered for order three days that is, and pattern data are generated. In this case, pattern data are the parts on the 7th from August 22 to August 28.

[0043] Since the operation effectiveness of Consumer Transaction Facility is raised when it is the day when dealings inclinations differ greatly compared with other days like [before or after a payday], the thing near the entrance of a branch may take the employment gestalt different from other days that only the day carries out only for payment, or by the official in charge, even Consumer Transaction Facility guides a user and it may change the use gestalt of Consumer Transaction Facility.

[0044] In such a case, the amount inclination of dealings which is different from other days like drawing 3 is shown. In drawing 3, although ATM1 shows the amount transition of dealings same from August 1 to August 21 as ATM2, it shows the same transition as ATM4 till August 22 to August 28. Moreover, although ATM3 shows the amount transition of dealings same from August 1 to August 21 as ATM4, the same transition as ATM2 is shown till August 22 to August 28.

[0045] When above, by clustering a prediction period like an example in payday order three days till August 22 to August 28, a cluster can be constituted from ATM1, and ATM4, ATM2 and ATM3.

pattern data can be created, and the effect of [at the time of carrying out the use gestalt in which the Consumer Transaction Facility group differed from other days] can be reflected in pattern data.

[0046] Next, the gestalt of the 3rd operation is explained.

[0047] The equipment configuration of the gestalt of the 3rd operation explains only the processing of the clustering section 5 which omits illustration and explanation and is different from the gestalt of the 1st operation since it is the same as that of the gestalt of the 1st operation with which it was shown in drawing 1 .

[0048] The clustering range decision section 52 is sent to the clustering activation section 53 by making into the clustering range only one day of the specific days which are the fixed values give beforehand. The clustering activation section 53 clusters considering the clustering range as an one-day specific day.

[0049] Drawing 4 is the schematic diagram of the pattern data generation in the gestalt of the 3r operation. The amount transition of dealings of four Consumer Transaction Facility ATM1, ATM2 ATM3, and ATM4 for one month from August 1, 1997 to August 31 is expressed with drawing 4 , and the pattern 1 and the pattern 2 express pattern data in case a specific day is on August 15 by it, for example. A specific day is a day when the amount of dealings will change only the day 1 da for example, is a special bargain day for a store, or a racetrack is located in near, and one day et has a big ball race.

[0050] Unlike payday order, the usual dealings will be conducted approximately on several, but t dealings inclination only with one unique day of a specific day is shown. In drawing 4 , although ATM1 shows the same amount transition of dealings as ATM2 except for August 15, August 15 is the same amount of dealings as ATM4. Moreover, although ATM3 shows the same amount transition of dealings as ATM4 except August 15, it is the same amount of dealings as ATM2 on August 15.

[0051] the effect of [at the time of carrying out the use gestalt in which the cluster was constituted from ATM1, and ATM4, ATM2 and ATM3, pattern data were created, and the Consumer Transaction Facility group differed from other days by clustering a prediction period li an example only on August 15 which is a day specially when above] -- pattern data -- reflectio **** -- things are made.

[0052] Next, the gestalt of the 4th operation is explained.

[0053] The equipment configuration of the gestalt of the 4th operation explains only the processing of the clustering section 5 which omits illustration and explanation and is different from the gestalt of the 1st operation since it is the same as that of the gestalt of the 1st operation with which it was shown in drawing 1 .

[0054] The clustering range decision section 52 is sent to the clustering activation section 53 by making into the clustering range the period of the arbitration given beforehand. The periods of th arbitration of the range of the above-mentioned clustering here are more than periods other than the period in said gestalt of the 1st - the 3rd operation, for example, one month. The clustering activation section 53 clusters considering the clustering range as a period of arbitration.

[0055] Drawing 5 is the schematic diagram of the pattern data generation in the gestalt of the 4t operation. The amount transition of dealings of four Consumer Transaction Facility ATM1, ATM2 ATM3, and ATM4 for three months from August 1, 1997 to October 31 is expressed with drawing 5 , and the pattern 1 and the pattern 2 express pattern data by it, for example. For example, the description of each period can be made to reflect in clustering by setting up the period of clustering freely according to the period in the situation that the period when a dealings inclinatio changes periodically exists. Moreover, when there is fluctuation of the loose amount of dealings, the period of the range of clustering is set up suitably three months and more than it, fluctuation the amount of dealings can be reflected in pattern data by **.

[0056] In drawing 5 , if it sees per one month called September 1 to September 30, ATM1 to ATM4 shows the same amount transition of dealings, but when it sees in three months from August 1 to October 30, it turns out from ATM1, and ATM2, ATM3 and ATM4 that a cluster can be

constituted.

[0057] As mentioned above, by fluctuating the clustering range suitably, the class evening ring s by the dealings trend of the Consumer Transaction Facility group can be performed, and the resu can be reflected in pattern data.

[0058] Next, the gestalt of the 5th operation is explained.

[0059] Drawing 6 shows roughly the configuration of the amount prediction equipment of funds o Consumer Transaction Facility concerning the gestalt of the 5th operation. In addition, since part other than clustering section 5 are the same configurations as the gestalt of the 1st operation mentioned above, illustration and explanation are omitted, and are illustrated and explained only about the different clustering section 5 from the gestalt of the 1st operation.

[0060] The clustering section 5 is constituted by the clustering range information input section 5 as 3rd input means, the clustering range decision section 52 as a decision means, and the clustering activation section 53 in drawing 6 . The clustering range information input section 51 acquires information required in order to determine the range of clustering, and sends it to the clustering range decision section 52. Based on the sent information, the clustering range decision section 52 determines the clustering range, and sends it to the clustering activation section 53.

[0061] The clustering range information input section 51 collects the following information, for example. There is information on the payday taken and mentioned by the above-mentioned explanation as information which determines the range of clustering, a special day, or the periods (for example, for three months etc.) of the clustering given clearly.

[0062] The clustering range decision section 52 determines the clustering range as follows from the information given from the clustering range information input section 51, for example. When a payday is given, payday order three days are made into the clustering range, when a day is given specially, an one-day day will be specially made into the clustering range, and when a clustering period is given clearly, let the period be the clustering range. As mentioned above, the clustering range decision section 52 generates the clustering range which was suitable based on the given information.

[0063] In addition, the clustering range information input section 51 is equipped with the user interface, and a bank official in charge may input direct information. Moreover, it may ask from th amount of dealings automatically by a program etc., or you may ask from the operation informatio from the Consumer Transaction Facility group etc. as an example of the approach of searching fo automatically, a day has extraordinarily more differences with the amount of dealings of the day order among the amount data of dealings than the threshold given beforehand, for example -- it and asks for the date. Moreover, a certain period can be searched for as range of clustering of th period from the operation information on the Consumer Transaction Facility group that all Consumer Transaction Facility treats only payment.

[0064] [Effect of the Invention] As explained in full detail above, according to this invention, the range o clustering One day, The special dealings inclination of a day to be able to take for one week at th period (one month or more) of arbitration, and for the amounts of dealings to differ only one day, The case where a dealings inclination differs from other days for one week like [before or after payday], and the case where a dealings inclination is gently changed in several months can be reflected in prediction of the amount of need funds, and predictability can be raised.

[0065] Moreover, since an official in charge can input the range of clustering, the highly precise amount prediction of need funds doubled with the dealings inclination of the Consumer Transactio Facility group concerned can be performed.

[0066] moreover -- since the range of clustering is automatically generable from dealings information, the operation information on Consumer Transaction Facility, etc. -- an official's in charge time and effort -- excluding -- in addition -- and the highly precise amount of need fund doubled with the dealings inclination of the Consumer Transaction Facility group concerned can b predicted.

CLAIMS

[Claim(s)]

[Claim 1] Example 36 Alcohol 8.0 Mass % concentrated glycerin 1.0 Dipropylene glycol 1.0 rice, while inputting the time series data of the dealings information from germ oil Consumer Transaction Facility Environmental information, such as a date at the time of dealings generating said Consumer Transaction Facility and a day of the week, is inputted. Make the time series data and environmental information which were these-inputted correspond, and it memorizes for the 1 storage means. A time series pattern is acquired by clustering the range of clustering for the time series data memorized for this 1st storage means as one day. This acquired time series pattern is memorized for the 2nd storage means with said inputted environmental information. Specify the environmental information of a prediction period and the environmental information of this specified prediction period is used. The amount prediction approach of funds of Consumer Transaction Facility characterized by what the time series pattern and environmental information of the past corresponding to a prediction period are searched from said 2nd storage means, and the amount need funds of a prediction period is predicted for using this time series pattern and environmental information that were searched.

[Claim 2] While inputting the time series data of the dealings information from Consumer Transaction Facility, the date at the time of dealings generating of said Consumer Transaction Facility, Input environmental information, such as a day of the week, and make the time series data and environmental information which were these-inputted correspond, and it memorizes for the 1 storage means. A time series pattern is acquired by clustering the time series data memorized for this 1st storage means as date order three days which gave the range of clustering beforehand. This acquired time series pattern is memorized for the 2nd storage means with said inputted environmental information. Specify the environmental information of a prediction period and the environmental information of this specified prediction period is used. The amount prediction approach of funds of Consumer Transaction Facility characterized by what the time series pattern and environmental information of the past corresponding to a prediction period are searched from said 2nd storage means, and the amount of need funds of a prediction period is predicted for using this time series pattern and environmental information that were searched.

[Claim 3] While inputting the time series data of the dealings information from Consumer Transaction Facility, the date at the time of dealings generating of said Consumer Transaction Facility, Input environmental information, such as a day of the week, and make the time series data and environmental information which were these-inputted correspond, and it memorizes for the 1 storage means. A time series pattern is acquired by clustering the time series data memorized for this 1st storage means as a period of the arbitration which gave the range of clustering beforehand. This acquired time series pattern is memorized for the 2nd storage means with said inputted environmental information. Specify the environmental information of a prediction period and the environmental information of this specified prediction period is used. The amount prediction approach of funds of Consumer Transaction Facility characterized by what the time series pattern and environmental information of the past corresponding to a prediction period are searched from said 2nd storage means, and the amount of need funds of a prediction period is predicted for using this time series pattern and environmental information that were searched.